

## PATENT COOPERATION TREATY

PCT

## NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Assistant Commissioner for Patents  
United States Patent and Trademark  
Office  
Box PCT  
Washington, D.C.20231  
ETATS-UNIS D'AMERIQUE

in its capacity as elected Office

<b>Date of mailing</b> (day/month/year) 12 October 2000 (12.10.00)	
<b>International application No.</b> PCT/EP00/00428	<b>Applicant's or agent's file reference</b> KP/BM45352
<b>International filing date</b> (day/month/year) 19 January 2000 (19.01.00)	<b>Priority date</b> (day/month/year) 22 January 1999 (22.01.99)
<b>Applicant</b> RUELLE, Jean-Louis	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:

21 July 2000 (21.07.00)

☐ in a notice effecting later election filed with the International Bureau on:2. The election ☒ was☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

<p>The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland</p> <p>Facsimile No.: (41-22) 740.14.35</p>	<p>Authorized officer</p> <p>S. De Michiel</p> <p>Telephone No.: (41-22) 338.83.38</p>
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## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification <sup>7</sup> : <b>C12N 15/31, C07K 14/22, A61K 39/095, C07K 16/12</b>		<b>A2</b>	(11) International Publication Number: <b>WO 00/43519</b>	
			(43) International Publication Date: 27 July 2000 (27.07.00)	
(21) International Application Number: PCT/EP00/00428		(81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).		
(22) International Filing Date: 19 January 2000 (19.01.00)		<b>Published</b> <i>Without international search report and to be republished upon receipt of that report.</i>		
(30) Priority Data:				
9901368.2	22 January 1999 (22.01.99)			GB
9901944.0	28 January 1999 (28.01.99)			GB
9902086.9	29 January 1999 (29.01.99)	GB		
9903417.5	15 February 1999 (15.02.99)	GB		
9903535.4	16 February 1999 (16.02.99)	GB		
(71) Applicant (for all designated States except US): SMITHKLINE BEECHAM BIOLOGICALS S.A. [BE/BE]; Rue de l'Institut 89, B-1330 Rixensart (BE).				
(72) Inventor; and				
(75) Inventor/Applicant (for US only): RUEELLE, Jean-Louis [BE/BE]; SmithKline Beecham Biologicals s.a., Rue de l'Institut 89, B-1330 Rixensart (BE).				
(74) Agent: PRIVETT, Kathryn, Louise; SmithKline Beecham, Two New Horizons Court, Brentford, Middlesex TW8 9EP (GB).				
(54) Title: NOVEL COMPOUNDS				
(57) Abstract				
<p>The invention provides BASB047, BASB054, BASB068 and BASB069 polypeptides, and polynucleotides encoding BASB047, BASB054, BASB068 and BASB069 polypeptides and methods for producing such polypeptides by recombinant techniques. Also provided are diagnostic, prophylactic and therapeutic uses.</p>				

**FOR THE PURPOSES OF INFORMATION ONLY**

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	ES	Spain	LS	Lesotho	SI	Slovenia
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AT	Austria	FR	France	LU	Luxembourg	SN	Senegal
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CI	Côte d'Ivoire	KP	Democratic People's Republic of Korea	NZ	New Zealand		
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CZ	Czech Republic	LI	Liechtenstein	RU	Russian Federation		
DE	Germany	LK	Sri Lanka	SD	Sudan		
DK	Denmark	LR	Liberia	SE	Sweden		
EE	Estonia			SG	Singapore		

## INTERNATIONAL SEARCH REPORT

International Application No

PL 1/EP 00/00428

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C12N15/31 C07K14/22 A61K39/095 C07K16/12

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C12N C07K A61K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 98 02547 A (INST NAT SANTE RECH MED ;MAX PLANCK GESELLSCHAFT (DE); SMITHKLINE) 22 January 1998 (1998-01-22) the whole document	1-24
A	--- MARTIN D ET AL: "HIGHLY CONSERVED NEISSERIA MENINGITIDIS SURFACE PROTEIN CONFERS PROTECTION AGAINST EXPERIMENTAL INFECTION" JOURNAL OF EXPERIMENTAL MEDICINE, vol. 185, no. 7, 1997, pages 1173-1183, XP000884332 ISSN: 0022-1007 cited in the application the whole document --- -/-	1-24

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

## \* Special categories of cited documents:

- \*A\* document defining the general state of the art which is not considered to be of particular relevance
- \*E\* earlier document but published on or after the international filing date
- \*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- \*O\* document referring to an oral disclosure, use, exhibition or other means
- \*P\* document published prior to the international filing date but later than the priority date claimed

- \*T\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- \*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- \*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
- \*Z\* document member of the same patent family

Date of the actual completion of the international search

17 April 2000

Date of mailing of the international search report

24 JULY 2000

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
Fax: (+31-70) 340-3016

Authorized officer

ANDRES S.M.

# INTERNATIONAL SEARCH REPORT

International Application No

PC/EP 00/00428

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>LISSOLO L ET AL: "EVALUATION OF TRANSFERRIN-BINDING PROTEIN 2 WITHIN THE TRANSFERRIN-BINDING PROTEIN COMPLEX AS A POTENTIAL ANTIGEN FOR FUTURE MEMINGOCOCCAL VACCINES"</p> <p>INFECTION AND IMMUNITY, vol. 63, no. 3, March 1995 (1995-03), pages 884-890, XP000877152 ISSN: 0019-9567 cited in the application</p> <p style="text-align: center;">---</p>	
A	<p>SATO Y ET AL: "IMMUNOSTIMULATORY DNA SEQUENCES NECESSARY FOR EFFECTIVE INTRADERMAL GENE IMMUNIZATION"</p> <p>SCIENCE, vol. 273, 19 July 1996 (1996-07-19), pages 352-354, XP002058357 ISSN: 0036-8075 cited in the application</p> <p style="text-align: center;">---</p>	
A	<p>CHEE M ET AL: "ACCESSING GENETIC INFORMATION WITH HIGH-DENSITY DNA ARRAYS"</p> <p>SCIENCE, vol. 274, 25 October 1996 (1996-10-25), pages 610-614, XP002050640 ISSN: 0036-8075 cited in the application</p> <p style="text-align: center;">-----</p>	

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/EP 00/00428

## Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Claims 1-24, (all partially)

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

**FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210**

1. Claims: 1-24 (all partially)

An isolated *Neisseria meningitidis* polypeptide defined as BASB047, nucleic acids or immunogenic fragments derived therefrom, its use in vaccine formulation; Antibodies directed against it, and their use in diagnostic or therapeutic compositions.

2. Claims: 1-24 (all partially)

As for subject 1, but concerning BASB054.

3. Claims: 1-24 (all partially)

As for subject 1, but concerning BASB068.

4. Claims: 1-24 (all partially)

As for subject 1, but concerning BASB069.

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/EP 00/00428

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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WO 9802547	A	22-01-1998	FR 2751000 A	16-01-1998
			AU 3697797 A	09-02-1998
			EP 0951552 A	27-10-1999

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REC'D 17 JAN 2001

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## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

15

Applicant's or agent's file reference KP/BM45352	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/EP00/00428	International filing date (day/month/year) 19/01/2000	Priority date (day/month/year) 22/01/1999
International Patent Classification (IPC) or national classification and IPC C12N15/31		
Applicant SMITHKLINE BEECHAM BIOLOGICALS S.A. et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.



2. This REPORT consists of a total of 6 sheets, including this cover sheet.

- ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 1 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☒ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☒ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand  21/07/2000	Date of completion of this report  15.01.2001
Name and mailing address of the international preliminary examining authority:   European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer  Moonen, P  Telephone No. +49 89 2399 8538  

# INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/EP00/00428

## I. Basis of the report

1. This report has been drawn on the basis of *(substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments (Rules 70.16 and 70.17).):*

### Description, pages:

1-85 as originally filed

### Claims, No.:

1-13,14 (part),21 (part), as originally filed  
22-24

14 (part),15-20, with telefax of 18/12/2000  
21 (part)

### Sequence listing part of the description, pages:

79-83, as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☒ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. PCT/EP00/00428

- ☐ the description,      pages:
- ☐ the claims,      Nos.:
- ☐ the drawings,      sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

*(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

6. Additional observations, if necessary:

**III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability**

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:

☐ the entire international application.

☒ claims Nos. 1-24 in part.

because:

☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (*specify*):

☐ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. are so unclear that no meaningful opinion could be formed (*specify*):

☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.

☒ no international search report has been established for the said claims Nos. 1-24 in part.

2. A meaningful international preliminary examination report cannot be carried out due to the failure of the nucleotide and/or amino acid sequence listing to comply with the standard provided for in Annex C of the Administrative Instructions:

☐ the written form has not been furnished or does not comply with the standard.

☐ the computer readable form has not been furnished or does not comply with the standard.

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

# INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/EP00/00428

## 1. Statement

Novelty (N)	Yes:	Claims	1-24
	No:	Claims	
Inventive step (IS)	Yes:	Claims	
	No:	Claims	1-24
Industrial applicability (IA)	Yes:	Claims	1-24
	No:	Claims	

## 2. Citations and explanations see separate sheet

## VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:  
see separate sheet

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT - SEPARATE SHEET**

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International application No. PCT/EP00/00428

Reference is made to the following documents (D):

- D1:** Infection and Immunity **32** (1981) 592-9
- D2:** Infection and Immunity **62** (1991) 3017-21
- D3:** Infection and Immunity **56** (1988) 977-83

The documents D1-D3 were not cited in the international search report. Copies of the documents (only the abstracts) have been sent to the applicant.

**Re Item III**

Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

1. The claims of the first invention have only been searched.

**Re Item V**

Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

2. The use of *N.meningitidis* polypeptides in vaccination or diagnostic methods is known (see the documents cited in the International Search Report). In addition, it was known that *Neisseria* spp. are growth-stimulated by the siderophore aerobactin, i.e. a receptor for aerobactin is expected in *Neisseria* spp. (see D1). D3 discloses that 17 of 18 meningococcal strains produced an iron-repressable outer membrane protein of 70 kD (a sequence homology between the receptors of different microorganisms including the sequence of the BASB047 gene is given in example 1 of the description). Finally, in relation to claim 20 it is noted that D2 discloses antibody against the related cloacin receptor.
3. The novelty of the claimed subject-matter is acknowledged (Article 33(2) PCT). However, the provision (selection) of the BASB047 sequences is considered to be obvious to the skilled person as they represent alternatives to already known sequences in *N.meningitidis*, in particular as it could be expected that a aerobactin receptor sequence (related to the known *E coli* receptor) is present in *N. meningitidis*. In the absence of any unexpected or demonstrated advantageous

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT - SEPARATE SHEET**

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International application No. PCT/EP00/00428

effect an inventive step cannot be acknowledged (Article 33(3) PCT) for **claims 1-24** on file.

**Re Item VII**

Certain defects in the international application

4. Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the documents D1-D3 is not mentioned in the description, nor are these documents identified therein.

\*\*\*\*\*

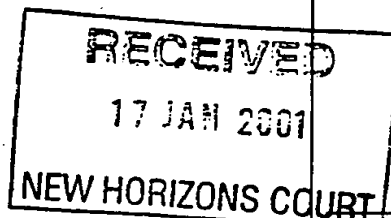
# PATENT COOPERATION TREATY

From the  
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

## PCT

To:

PRIVETT, K.  
SMITHKLINE BEECHAM  
Two New Horizons Court  
Brentford  
Middlesex TW8 9EP  
GRANDE BRETAGNE



NOTIFICATION OF TRANSMITTAL OF  
THE INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT  
(PCT Rule 71.1)

Date of mailing  
(day/month/year) 15.01.2001

Applicant's or agent's file reference  
KP/BM45352

### IMPORTANT NOTIFICATION

International application No.  
PCT/EP00/00428

International filing date (day/month/year)  
19/01/2000

Priority date (day/month/year)  
22/01/1999

Applicant  
SMITHKLINE BEECHAM BIOLOGICALS S.A. et al.

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

#### 4. REMINDER

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

Name and mailing address of the IPEA/



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D-80298 Munich  
Tel. +49 89 2399 - 0 Tx: 523656 epmu d  
Fax: +49 89 2399 - 4465

Authorized officer

Papiol Rovira, M

Tel. +49 89 2399-7199



# PATENT COOPERATION TREATY

## PCT

### INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference <b>KP/BM45352</b>	<b>FOR FURTHER ACTION</b>		See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. <b>PCT/EP00/00428</b>	International filing date (day/month/year) <b>19/01/2000</b>	Priority date (day/month/year) <b>22/01/1999</b>	
International Patent Classification (IPC) or national classification and IPC <b>C12N15/31</b>			
Applicant <b>SMITHKLINE BEECHAM BIOLOGICALS S.A. et al.</b>			
<p>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 6 sheets, including this cover sheet.</p> <p><input checked="" type="checkbox"/> This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of 1 sheets.</p>			
<p>3. This report contains indications relating to the following items:</p> <ul style="list-style-type: none"> <li>I <input checked="" type="checkbox"/> Basis of the report</li> <li>II <input type="checkbox"/> Priority</li> <li>III <input checked="" type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</li> <li>IV <input type="checkbox"/> Lack of unity of invention</li> <li>V <input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</li> <li>VI <input type="checkbox"/> Certain documents cited</li> <li>VII <input checked="" type="checkbox"/> Certain defects in the international application</li> <li>VIII <input type="checkbox"/> Certain observations on the international application</li> </ul>			
Date of submission of the demand  <b>21/07/2000</b>		Date of completion of this report  <b>15.01.2001</b>	
Name and mailing address of the international preliminary examining authority:  <div style="display: flex; align-items: center;"> <div>             European Patent Office              D-80298 Munich              Tel. +49 89 2399 - 0 Tx: 523656 epmu d              Fax: +49 89 2399 - 4465           </div> </div>		Authorized officer  <b>Moonen, P</b>  Telephone No. +49 89 2399 8538	





**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. PCT/EP00/00428

**I. Basis of the report**

1. This report has been drawn on the basis of *(substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments (Rules 70.16 and 70.17).):*

**Description, pages:**

1-85 as originally filed

**Claims, No.:**

1-13,14 (part),21 (part), as originally filed  
22-24

14 (part),15-20, with telefax of 18/12/2000  
21 (part)

**Sequence listing part of the description, pages:**

79-83, as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☒ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

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- ☐ the description, pages:  
☐ the claims, Nos.:  
☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

*(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

6. Additional observations, if necessary:

**III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability**

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:

- ☐ the entire international application.  
☒ claims Nos. 1-24 in part.

because:

- ☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (*specify*):
- ☐ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. are so unclear that no meaningful opinion could be formed (*specify*):
- ☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.
- ☒ no international search report has been established for the said claims Nos. 1-24 in part.
2. A meaningful international preliminary examination report cannot be carried out due to the failure of the nucleotide and/or amino acid sequence listing to comply with the standard provided for in Annex C of the Administrative Instructions:
- ☐ the written form has not been furnished or does not comply with the standard.
- ☐ the computer readable form has not been furnished or does not comply with the standard.

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

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## 1. Statement

Novelty (N)	Yes:	Claims	1-24
	No:	Claims	
Inventive step (IS)	Yes:	Claims	
	No:	Claims	1-24
Industrial applicability (IA)	Yes:	Claims	1-24
	No:	Claims	

## 2. Citations and explanations

**see separate sheet**

## VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:  
**see separate sheet**

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Reference is made to the following documents (D):

**D1:** Infection and Immunity 32 (1981) 592-9

**D2:** Infection and Immunity 62 (1991) 3017-21

**D3:** Infection and Immunity 56 (1988) 977-83

The documents D1-D3 were not cited in the international search report. Copies of the documents (only the abstracts) have been sent to the applicant.

**Re Item III**

Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

1. The claims of the first invention have only been searched.

**Re Item V**

Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

2. The use of *N.meningitidis* polypeptides in vaccination or diagnostic methods is known (see the documents cited in the International Search Report). In addition, it was known that *Neisseria* spp. are growth-stimulated by the siderophore aerobactin, i.e. a receptor for aerobactin is expected in *Neisseria* spp. (see D1). D3 discloses that 17 of 18 meningococcal strains produced an iron-repressable outer membrane protein of 70 kD (a sequence homology between the receptors of different microorganisms including the sequence of the BASB047 gene is given in example 1 of the description). Finally, in relation to claim 20 it is noted that D2 discloses antibody against the related cloacin receptor.
3. The novelty of the claimed subject-matter is acknowledged (Article 33(2) PCT). However, the provision (selection) of the BASB047 sequences is considered to be obvious to the skilled person as they represent alternatives to already known sequences in *N.meningitidis*, in particular as it could be expected that a aerobactin receptor sequence (related to the known *E coli* receptor) is present in *N. meningitidis*. In the absence of any unexpected or demonstrated advantageous

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effect an inventive step cannot be acknowledged (Article 33(3) PCT) for **claims 1-24** on file.

**Re Item VII**

Certain defects in the international application

4. Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the documents D1-D3 is not mentioned in the description, nor are these documents identified therein.

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sequence that has at least 85% identity to the amino acid sequence selected from the group consisting of: SEQ ID NO:2, SEQ ID NO:4, SEQ ID NO:6, SEQ ID NO:8.

15. A process for producing a polypeptide comprising an amino acid sequence that has at least 85% identity to an amino acid sequence selected from the group consisting of: SEQ ID NO:2, SEQ ID NO:4, SEQ ID NO:6, SEQ ID NO:8 comprising culturing a host cell of claim 14 under conditions sufficient for the production of said polypeptide and recovering the polypeptide from the culture medium.
16. A process for expressing a polynucleotide of any one of claims 6 to 12 comprising transforming a host cell with the expression vector comprising at least one of said polynucleotides and culturing said host cell under conditions sufficient for expression of any one of said polynucleotides.
17. A vaccine composition comprising an effective amount of the polypeptide of any one of claims 1 to 5 and a pharmaceutically acceptable carrier.
18. A vaccine composition comprising an effective amount of the polynucleotide of any one of claims 6 to 12 and a pharmaceutically effective carrier.
19. The vaccine composition according to either one of claims 17 or 18 wherein said composition comprises at least one other *Neisseria meningitidis* antigen.
20. An antibody generated against the polypeptide or immunological fragment as claimed in any one of claims 1 to 5.
21. A method of diagnosing a *Neisseria meningitidis* infection, comprising identifying a polypeptide as claimed in any one of claims 1 to 5, or an antibody that is immunospecific